



**UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/992,767	12/17/97	YOKOYAMA	NEC-19654

MM11/0525  
HAYES SOLOWAY HENNESSEY GROSSMAN  
& HAGE  
175 CANAL STREET  
MANCHESTER NH 03101

EXAMINER  
WILLE, D

ART UNIT 2814	PAPER NUMBER
------------------	--------------

DATE MAILED: 05/25/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

# Office Action Summary

Application No.

08/992,767

Applicant(s)

Yokoyama

Examiner

Douglas Wille

Group Art Unit

2814

☒ Responsive to communication(s) filed on Mar 12, 1999

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

Art Unit: 2814

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1 - 4, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. in view of Miller et al.

3. With respect to claims 1 - 4, 7 and 8, Roberts et al. show (see cover Figure and column 2, line 37 - column 7, line 12) a structure with a wide via (low aspect ratio) in an insulating layer 12 where a tapered refractory metal layer 30 is formed in the corners of the hole to improve step coverage of the metal film 40 and the upper end of the hole is funnel shaped. Miller et al. show (see cover Figure and column 5, line 22 - column 6, line 30) the filling of a high aspect ratio hole (column 2, line 43) with a refractory metal plug. It would have been obvious to include a technique for filling a high aspect ratio hole along with an approach to filling a low aspect ratio hole to provide a broader applicability to the electroding technique.

4. Claims 1 - 4, 7 and 8, in so far as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over McDavid in view of Miller et al.

5. With respect to claims 1 - 4, 7 and 8, McDavid shows (see cover Figure and column 2, line 19 - line 61) a structure with a wide via (low aspect ratio) in an insulating layer 21 where a tapered refractory metal layer 13 is formed in the corners of the hole to improve step coverage of

Art Unit: 2814

the metal film 10 and the upper end of the hole is funnel shaped. Miller et al. show (see cover Figure and column 5, line 22 - column 6, line 30) the filling of a high aspect ratio hole (column 2, line 43) with a refractory metal plug. It would have been obvious to include a technique for filling a high aspect ratio hole along with an approach to filling a low aspect ratio hole to provide a broader applicability to the electroding technique.

6. Claims 5, 6, 9 and 10, in so far as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over McDavid and Roberts et al. in view of Miller et al.

7. McDavid shows a refractory layer which is high in form and Roberts et al. show a refractory layer that is low in form. Since both show a useful structure it would have been obvious to use any form in-between the two.

### ***Response to Arguments***

8. Applicant's arguments filed 3/12/99 have been fully considered but they are not persuasive.

9. Applicant argues that neither Roberts et al. nor McDavid show both small and large holes, which is true, but since both large and small holes are shown in the prior art, it is obvious to combine the two techniques and provide a contacting capability with the widest applicability.

### ***Conclusions***

10. **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2814

11. A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.
12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A. Wille whose telephone number is (703) 308-4949.
13. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose number is (703) 308-0956.



Olik Chaudhuri  
Supervisory Patent Examiner  
Art Unit 2814

DAW DAW

May 21, 1999